

## ABSTRACT OF THE DISCLOSURE

A method for producing a high resolution detector array so as to provide very high packing fraction, i.e. the distance between scintillator elements is minimized so the detector efficiency will be higher than is currently achievable. In the preferred embodiment of the present invention, the fabrication methodology is enhanced by handling scintillator bars rather than single crystals when gluing on an optical film as well as polishing the scintillator. Namely, a scintillator boule is cut into wide bars of a selected dimension, for example 30 mm, which are then acid etched or mechanically polished. A selected number,  $N$ , of these scintillator bars can then be glued together with sheets of optical film between each bar (coating the scintillator disks and optical film with an adhesive of a selected index of refraction). The glued bar block is then cut again into bars in a perpendicular direction, and these new scintillator-optical film bars are polished. Finally, a selected number,  $M$ , of these scintillator-optical film bars are glued together with sheets of optical film between each bar; thus creating a polished  $N \times M$  scintillator-optical film array, (where  $M$  may or may not be equal to  $N$ ), without having to handle individual scintillator crystals or small pieces of optical film.